

## LOWER GOOSEBERRY RESERVOIR



### Introduction

Lower Gooseberry Reservoir is located in a sage-grass meadow on the north side of the Wasatch Plateau. It is an intermediate sized impoundment of a meadow high in the Price River watershed. It is located within the boundaries of land administered by the Bureau of Reclamation. The reservoir was first impounded in 1939

by construction of an earth-fill dam on Gooseberry Creek. In 1990 the dam was reconstructed. Although the immediate vicinity of the reservoir is primary a sage-grass community, it is nestled in the high mountains with aspen

Characteristics and Morphometry	
Lake elevation (meters / feet)	2,568 / 8,424
Surface area (hectares / acres)	23.4 / 57.3
Watershed area (hectares / acres)	3301 / 8329
Volume (m <sup>3</sup> / acre-feet)	
capacity	261,502 / 212
conservation pool	
Annual inflow (m <sup>3</sup> / acre-feet)	See Narrows Dam
Retention time (years)	unknown
Mean annual vertical fluctuation (meters / feet)	1.2 / 4.0
Depth (meters / feet)	
maximum	5 / 16.4
mean	1.1 / 3.7
Length (meters / feet)	1,370 / 4,488
Width (meters / feet)	258 / 845
Shoreline (km / miles)	3 / 1.8

### Location

County	Sanpete
Longitude / Latitude	111 17 30 / 39 42 30
USGS Map	Huntington Reservoir 1978
DeLorme's Atlas and Gazetteer™	Page 46 D-2
Cataloging Unit	San Rafael (14060009)

and conifer forests in the immediate vicinity. There are a number of summer recreational homes in the area with plans for continued development in the area. The shoreline is owned and managed by the Bureau of Reclamation with unrestricted public access. Reservoir water is used primarily for downstream irrigation and public recreation.

### Recreation

Lower Gooseberry Reservoir is directly accessible  
f r o m

File Contains Data for  
PostScript Printers Only

state highway 31 between Fairview and Huntington. From Fairview, travel 10 miles east on U-31. Take highway U-264 near the top of the mountain. Shortly after leaving U-31 as U-264 turns eastward towards Electric Lake, a gravel road goes north to the reservoir. It is well marked and proceeds past a forest service campground and ranger station to the reservoir (3-4 miles).

Although the area generally receives moderate recreational usage, heavy usage occurs on holiday weekends. Fishing is the primary activity, however, boating, camping, swimming, nordic skiing and snowmobiling are also thoroughly enjoyed.

Recreational facilities are limited and primitive in the area. Visitors are required to pack out their own trash. There is a Forest Service Campgrounds located in the forested area prior to the reservoir. The camping area provides 10 camping units with vault toilets, fire pits, tables, and drinking water.



### Watershed Description

The reservoir is in an area of rolling ridges and valleys characteristic of the Wasatch Plateau. Inflows to the reservoir consist primarily of Gooseberry Creek, Japanese Creek and Brooks Canyon Creek. Water leaves the reservoir via Gooseberry Creek, a tributary to Fish Creek, a major source of water for Scofield Reservoir.

The watershed high point is 3,184 m (9,706 ft) above sea level, thereby developing a complex slope of 11% to the reservoir. The average stream gradient above the reservoir is 3.0% (156 feet per mile).

The soil is of limestone origin and has good permeability and moderately slow erosion and runoff. Soil groupings are found in Appendix III.

The vegetation communities are comprised of sage-grass, pine, aspen, spruce-fir, oak and maple. The watershed receives 76-102 cm (30-40 inches) of precipitation annually with a frost-free season of 40 - 60 days at the reservoir.

Land use in the reservoir is 100% multiple use forest

lands, used for hunting, recreation, livestock grazing and privately developed recreational property.

### Limnological Assessment

The water quality of Lower Gooseberry Reservoir is good. It is considered to be moderately hard with a hardness concentration value of approximately 144 mg/L (CaCO<sub>3</sub>). The only parameters that have exceeded State water quality standards for defined beneficial uses are phosphorus, pH, and dissolved oxygen. The average concentration of total phosphorus in the water column has not exceeded the recommended pollution indicator for phosphorus of 25 ug/L, but on occasion values are reported at various depths in the water column. On occasion dissolved oxygen levels (2.3 mg/L) and pH values (10.2) have violated state standards near the bottom of the reservoir. The factor in the reservoir responsible for this phenomenon is the extensive macrophyte coverage of the bottom of the reservoir. The reservoir is shallow with good light penetration throughout the water column. Although the submerged plant material

#### Limnological Data

Data sampled from STORET site: 593224

Surface Data	1981	1990	1991
Trophic Status	M	M	M
Chlorophyll TSI	-	39.39	29.57
Secchi Depth TSI	50.01	48.64	50.75
Phosphorous TSI	37.35	49.04	52.45
Average TSI	43.68	45.69	44.26
Chlorophyll <i>a</i> (ug/L)	-	2.5	0.9
Transparency (m)	2	2.2	1.9
Total Phosphorous (ug/L)	10	22.5	28.5
pH	7.9	8.6	9.1
Total Susp. Solids (mg/L)	5	<3	5
Total Volatile Solids (mg/L)	-	-	5
Total Residual Solids (mg/L)	-	-	<1
Temperature (°C / °f)	18/64	14/56	15/58
Conductivity (umhos.cm)	325	235	233

#### Water Column Data

Ammonia (mg/L)	-	0.03	0.03
Nitrate/Nitrite (mg/L)	-	0.04	0.06
Hardness (mg/L)	179	140.3	113.3
Alkalinity (mg/L)	-	120	119
Total Phosphorus (ug/L)	-	24	24.8
Silica (mg/L)	-	-	4.0

#### Miscellaneous Data

Limiting Nutrient	P		
DO (Mg/l) at 75% depth	8.4	-	10.2
Stratification (m)	4	NO	NO
Depth at Deepest Site (m)	5	3.7	2.5

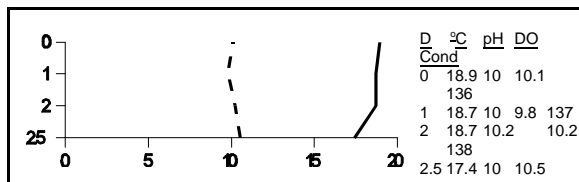
## LAKE REPORTS

produces oxygen during the day, it elevates the pH concentration during the day and reduces the dissolved oxygen concentration during the night. It is evident from the August 29, 1991 profile that the reservoir is too shallow to produce stratification. Although the reservoir was reported in 1981 to be phosphorus limited, current data suggest that the reservoir is in fact a nitrogen limited system. TSI values indicate the reservoir is a fairly stable mesotrophic system.

According to DWR fish kills have been reported during severe winter conditions. This is to be expected with the large amounts of organic material that accumulate from summer macrophyte growth. As this organic material decays and is decomposed oxygen is consumed. Because the reservoir is shallow and oxygen production is largely inhibited during the period of ice coverage the reservoir's dissolved oxygen content is reduced to the point that it cannot sustain a viable fishery. A profile conducted on March 5, 1992 indicates the severity of the depletion. At the surface the dissolved oxygen concentration was 1.1 mg/L, but quickly dropped to 0.4 mg/L throughout the majority of the water column.

The reservoir supports populations of rainbow trout (*Oncorhynchus mykiss*), and cutthroat trout (*Oncorhynchus clarki*). The lake has not been treated for rough fish competition, so populations of native fishes may still be present in the lake. According to a recent stocking records Lower Gooseberry Reservoir is stocked with 12,000 catchable rainbow trout.

A 1978 USFS limnological survey noted the existence of rainbow and cutthroat trout. Many species of macroinvertebrates were observed including Odonata, Hemiptera, Tricoptera, Coleoptera, Diptera, Amphipoda, Mollusca and Leeches. Zooplankton in the reservoir was composed almost entirely of *Daphnia*. In addition the reservoir had large amounts of submerged macrophyte growth which reached the surface in about 40% of the reservoir's total area.



Phytoplankton in the euphotic zone include the following taxa (in order of dominance)

Species	Cell Volume (mm <sup>3</sup> /liter)	% Density By Volume
<i>Dictyosphaerium pulchellum</i>	6.738	83.4
<i>Gomphosphaeria lacustris</i>	5.615	4.85
<i>Sphaerocystis Schroeteri</i>	5.282	4.56

<i>Anabaena sp.</i>	3.892	3.36
<i>Anabaena sp. 2</i>	1.112	0.96
<i>Staurastrum gracile</i>	0.722	0.62
<i>Fragilaria crotonensis</i>	0.687	0.59
<i>Staurastrum sp.</i>	0.667	0.58
<i>Staurastrum sp.</i>	0.500	0.43
Pennate diatoms	0.183	0.16
<i>Cosmarium sp.</i>	0.157	0.14
<i>Oocystis sp.</i>	0.108	0.09
<i>Spirulina sp.</i>	0.056	0.05
<i>Cylindrospermum stagnale</i>	0.056	0.05
<i>Stichococcus bacillaris</i>	0.028	0.02
<i>Tetraedrom minimum</i>	0.021	0.02
<i>Oscillatoria sp.</i>	0.018	0.02
<i>Scenedesmus bijuga</i>	0.015	0.01
<i>Microcystis incerta</i>	0.011	0.01
<i>Gomphosphaeria sp.</i>	0.006	0.01
<i>Merisniopekia tenuissima</i>	0.003	0.00
<i>Chlamydomonas sp.</i>	0.002	0.00

Total 115.876

Shannon-Weaver [H']	0.75
Species Evenness	0.24
Species Richness	0.82

The flora is fairly typical, but not particularly diverse. The dominance of green algae and diatoms indicates that the lake is reasonably healthy.

## Pollution Assessment

Nonpoint pollution sources include nutrient loading and sedimentation from grazing and litter and human wastes from recreation. About 1,000 sheep graze in the immediate vicinity of the reservoir for two weeks each year. Cattle also graze the area. No mining or logging takes place in the region.

There are no point pollution sources in the watershed.

## Information

### Management Agencies

Dixie National Forest	586-2421
Teasdale Ranger District	425-3435

### Recreation

Red Cliff Oasis (Torrey RV Park)	425-3431
Six County Commissioners Association	896-9222

### Reservoir Administrators

Division of Wildlife Resources	538-4700
Division of Water Quality	538-6146

### **Beneficial Use Classification**

The state beneficial use classification for the waters of Lower Gooseberry Reservoir include: boating and similar recreation (excluding swimming) (2B), cold water game fish and organisms in their food chain (3A) and agricultural uses (4).